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Effects of a realistic strange quark mass and color neutrality on the QCD phase diagram[1] PHILIP POWELL, GORDON BAYM, University of Illinois at Urbana-Champaign — In this study we investigate the effects of an intermediate strange quark mass (m_s), confinement, and color neutrality on the phase structure of dense three flavor QCD by means of the Nambu–Jona-Lasinio model with Polaykov loop. Particular attention is paid to the prospects for realizing a proposed low-temperature critical point, which may allow for a smooth crossover between hadronic and color superconducting (CSC) matter at low temperatures. We analyze the decoupling of the strange quark sector from the two lighter flavors with increasing m_s and also discuss the possibility of an asymmetric coupling between the Polyakov loop and quarks of different colors, which may give rise to an asymmetric CFL (ACFL) phase. Finally, we consider the effects of a local color neutrality constraint on the CSC phases which are expected at high densities, in both the equal and unequal mass cases.

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